



Idaho Department of Fish and Game

Lake Pend Oreille Quarterly Report

April - June 2004



Pelagic Predators Estimated

Researchers are one step closer to developing a method to estimate the abundance of large rainbow trout (Kamloops) in Lake Pend Oreille. Being able to know how many rainbows exist in the lake is a key part in balancing predator and prey. It may also be instrumental in evaluating angling regulations that are designed to improve the rainbow trout fishing.

Last summer the lake was extensively surveyed using hydroacoustic gear (echosounding gear) (Figure 1). The task this spring was to analyze the 3 gigabytes of data gathered last year and determine the number of predators in the area surveyed. One group of large fish was relatively shallow (<100

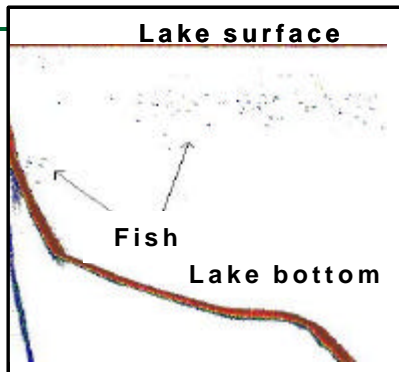


Figure 1. Echogram of Lake Pend Oreille made during the 2003 hydroacoustic survey.

ft), in open water, and had estimated weights ranging from 2 to 30 lbs based on their returned

(Continued, page 2.)

Spring Tagging Effort

During this past quarter we utilized a combination of electrofishing, gill-netting, and seining to collect 22 predator fish (Figure 2). All fish were surgically implanted with depth sensing sonic tags, which will enable us to determine their habitat use during the summer season. In total 15 rainbow trout (2.5-22.0 lbs), 5 bull trout (2.3-7.8 lbs), and 2 lake trout (1.9 and 4.0 lbs) were collected. All fish were successfully tagged and released. This brings the total number of fish tagged to; 16 rainbow trout, 15 bull trout, and 11 lake trout. Fish will be tracked this summer to determine where different species are located in the hydroacoustic surveys.



Figure 2. A rainbow trout being collected from Spring Creek, a tributary of Lake Pend Oreille, by researchers from the Bayview Research Station.

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SPECIAL POINTS OF INTEREST:

- Hydroacoustic surveys indicated 12,000 large fish (possibly rainbows) in the open water of Lake Pend Oreille
- Estimates indicate 1 pound of predator to 4.6 pounds of kokanee.
- Twenty two fish were tagged with depth-sensitive sonic tags during the previous quarter.
- Mysis shrimp abundance drops slightly in 2004.

Pelagic Predators Estimated, continued from page 1.

echo (Figure 3). They were in water of about 54 degrees F and were not in schools of similar sized fish. Our working hypothesis is that they may be rainbow trout. Tracking studies this summer are underway to test this finding (see article on page 3). We estimated the lake contained about 12,000 of these possible rainbow trout over 16" with a total weight of 34 tons (English). This was similar to a population estimate of 14,600 rainbow trout made in 1999 by having anglers mark and recapture the rainbows they caught.

This past winter we also estimated the lake contained 6,400 lake trout over 20". Adding together the weight of these predators, and comparing the sum to the weight of kokanee in the lake, yielded a ratio of 1 pound of predator for every 4.6 pounds of kokanee. Is this predator ratio too high? For that we need to look at the kokanee population. Over the last year, kokanee expanded in the lake by 65 tons; indicating that predation was not holding kokanee recovery back. But, by looking at the current survival rates of kokanee and their previous declines in abundance, researchers suspect that this ratio may be near what the kokanee population could support. Hopefully, future lake level management will continue to boost the kokanee population and improve the predator to prey ratio.

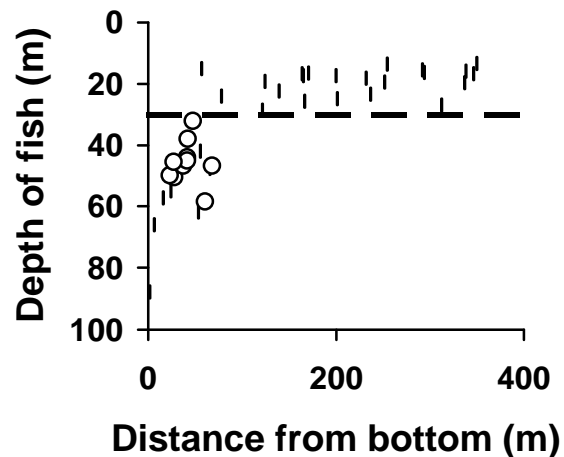


Figure 3. Depths and distances from the lake bottom for large fish (>16 ") in the night-time hydroacoustic survey during 2003. Open circles represent fish that were in an aggregation of similar sized fish. Note the separate group of fish above the dotted line that are possibly rainbow trout.

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New Depth Tag for Research

In order for us to determine the habitat use of predator fish < 5 lbs, we purchased 30 depth sensing sonic tags that were about half the size of our original tags (Figure 4). Because of the relatively small size of these tags we can implant them in fish as small as 2 lbs. These smaller tags will not give us the detection range achieved with our bigger tags (1.0 mile with big tag, 0.5 mile with smaller tag) but will acquire data on predator fish that make up the bulk of the population (i.e., there are more fish < 5 lbs than there are > 5 lbs). Of the 42 fish that we have sonic tagged, 18 have small tags. If anglers do capture and harvest a fish with a tag, they are encouraged to please return the tag to any Idaho Fish and Game employee or call us at 683-9218.



Figure 4. Picture showing 2 different sizes of sonic tags used to track predator fish in Lake Pend Oreille. The bottom (smaller) tag will be used to determine habitat use of predator fish < 5

Spring Tracking of Rainbow Trout

Thus far we have located 7 of the 16 rainbow trout that we have tagged in the lake. Unfortunately, one of these fish was either found dead or it expelled its tag down at the southern end of the lake near Evans Landing. This rainbow trout was an 8.8 lb fish that was tagged and released in Spring Creek on 4/23/04. Day-time tracking during June indicated that rainbow trout utilized an average depth of 16 ft and an average temperature of 58 degrees F. Our tagged rainbow trout were located in the open water or pelagic area (in water >

200 ft deep) 70% of the time and in nearshore or littoral areas 20 % of the time. One fish was tracked and located hiding under a dock in 24 ft of water. As the thermocline sets up in the lake we will again monitor the depths used by rainbow trout. More emphasis will also be placed on night-time tracking to correspond to our August hydroacoustic survey. This should enable us to make an accurate rainbow trout population estimates using hydroacoustics.

“Day-time tracking during June indicated that rainbow trout utilized an average depth of 16 ft and an average temperature of 58 degrees F.

Mysis Shrimp Population Estimate

Mysis shrimp in Lake Pend Oreille declined to slightly lower levels in 2004. The shrimp population increased last year but has returned to a lower density this year (Figure 5).

Researchers sampled shrimp in June 2004 and collected 45 random samples of shrimp using a 1 m diameter hoop net. This is an increase in the number of samples from previous years in an attempt to tighten the confidence limits. The geometric mean density of adult and immature shrimp was 201 shrimp/m² with a 90% confidence limit of – 16% to + 19%. Arithmetic mean densities were also calculated to be consistent with previous years (Figure 5). The last two years of data makes any downward trend in the population less obvious.

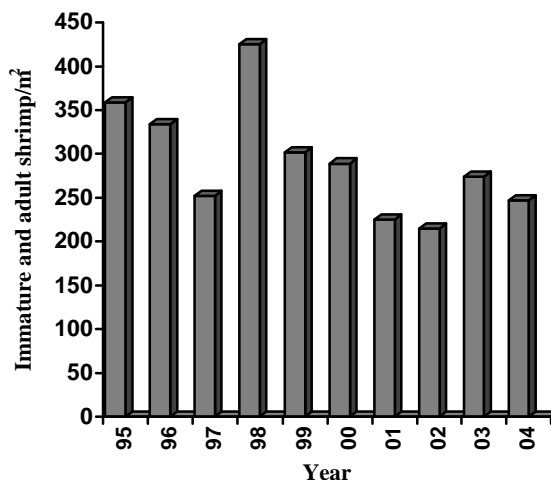


Figure 5. Densities of adult and immature Mysis shrimp (excludes young-of-the-year) in Lake Pend Oreille.

Links

To Past Reports

Are you looking for past annual reports concerning Lake Pend Oreille?

They can be found on the Idaho Fish and Game's Home Page (<http://fishandgame.idaho.gov>) under the headings of: Technical/Research, Research Reports, Fisheries, then do a word search on "Lake Pend Oreille".

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Activities for next quarter

The next quarter will have some of the more interesting field activities. In July, we will sample shoreline spawning areas by scuba diving and core sampling the substrates. These will then be dried and screened to determine the percent that is cobble, gravel, and fine material. Our interest here is to see how the gravel bars, that were created last winter, have fared to this point in the year.

We are planning some major sampling of the lake in August. Hydroacoustic surveys will be conducted at the beginning of August. Followed by kokanee fry trawling, which is then followed by the trawling for the older age classes of kokanee. Days in between sampling will be used to

begin processing the samples.

Each month we have also scheduled a limnological survey to record temperature, oxygen, and Secchi transparency. These are helpful in understanding the distribution of fish seen in the hydroacoustic surveys. Throughout the next quarter, we will be tracking the sonic tagged fish. Lake trout, rainbow trout, and bull trout will be tracked to determine their habitat usage during mid-summer. Knowing their habitat is fundamental in making a hydroacoustic estimate of the pelagic predators.

Lastly, kokanee spawner counts will begin in September as the early spawning strain returns to spawn in Trestle Creek.



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